UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/722,142	11/24/2003	Dan T. Simionescu	CXU-379	4675

22827 7590 10/17/2007

DORITY & MANNING, P.A.
POST OFFICE BOX 1449
GREENVILLE, SC 29602-1449

EXAMINER	
KUMAR, PREETI	

ART UNIT	PAPER NUMBER
1796	

MAIL DATE	DELIVERY MODE
10/17/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/722,142	SIMIONESCU ET AL.	
	Examiner	Art Unit	
	Preeti Kumar	1796	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 August 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *20,21,23,24,28,29 and 48-53* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *20-21, 23-24, 28-29, and 48-53* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *8/9/2007*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Final Rejection

1. Claims 20-21, 23-24, 28-29, and 48-53 are pending. Claims 20 and 48 are independent. Claims 48-53 are newly added in the amendment filed 8/9/2007.

2. Claims 1-19, 22, 25-27 and 41-46 are cancelled.

3. Applicant's argument to have the withdrawn claims rejoined is not found persuasive since applicants have elected the implantable fixed tissue and not the product claims to the fixed tissue on a bioprosthetic support material. The search for the bioprosthetic support material is a distinctly different search from the implantable fixed tissue and would constitute an undue search burden. The finality of the restriction requirement stands since it is deemed proper as of the first office action dated 4/6/2006.

Response to Amendment

4. The objection of claim 24 is withdrawn upon further consideration of Applicant's arguments.

5. The rejection of claims 20-21, 23-24, 28-29 under 35 U.S.C. 103(a) as being unpatentable over Nimni et al. (US 4,378,224) in view of Nimni et al. (US 5,374,539) is maintained for the reasons of record.

6. The rejection of claims 20-21, 23-24, 28 and 48-52 under 35 U.S.C. 103(a) as obvious over Adkisson (US 6,645,764) in view of Asculai et al. (US 6,444,222) is maintained for the reasons of record.

Response to Arguments

Applicant's arguments filed 8/9/2007 have been fully considered but they are not persuasive. Applicants urge neither Nimni, et al. '224 nor Nimni, et al. '539 disclose a fixed tissue including cross-linked elastin. In addition, neither Nimni, et al. '224, nor Nimni, et al. '539 disclose or suggest a fixed tissue including the residue of a phenolic tannin bound to and cross-linking elastin of the tissue. Also Applicants urge Nimni, et al. '224 and Nimni, et al. '539 fail to disclose or suggest additional limitations of the claims as well. For instance, even were Nimni, et al. '224 and Nimni, et al. '539 to be combined as suggested in the Office Action, the combined references would still fail to disclose or suggest an implantable tissue including a residue of a phenolic tannin cross-linking agent bound to and crosslinking elastin of the tissue and also including a residue of a glutaraldehyde cross-linking agent bound to and cross- linking collagen of the fixed tissue as is found in claim 24. Applicants urge, even if combined, the combined references would still fail to disclose or suggest an implantable fixed tissue including both a residue of a phenolic tanninacross-linking agent bound to and cross-linking elastin of the fixed tissue, and also including a residue of an aldehyde cross-linking agent bound to and cross-linking collagen of the fixed tissue, as is found in claim 48.

Finally Applicants urge that even if combined, the combination of Adkisson and Asculai, et al. does not disclose or suggest an implantable fixed tissue including cross-linked elastin. In addition, the combination of Adkisson and Asculai, et al. does not disclose or suggest a fixed tissue including the residue of a phenolic tannin bound to and cross-linking elastin of the tissue. Applicants urge Adkisson and Asculai, et al. fail

to disclose or suggest an implantable tissue including a residue of a phenolic tannin cross-linking agent bound to and crosslinking elastin of the tissue and also including a residue of a glutaraldehyde cross-linking agent bound to and cross-linking collagen of the fixed tissue as is found in claim 24. In addition, even if combined, the combined references would still fail to disclose or suggest an implantable fixed tissue including both a residue of a phenolic tannin cross-linking agent bound to and cross-linking elastin of the fixed tissue, and also including a residue of an aldehyde cross-linking agent bound to and cross-linking collagen of the fixed tissue, as is found in claim 48.

Applicant's arguments fail to comply with 37 CFR 1.111(b) because they amount to a general allegation that the claims define a patentable invention without specifically pointing out how the language of the claims patentably distinguishes them from the references. Also, Applicant's arguments do not comply with 37 CFR 1.111(c) because they do not clearly point out the patentable novelty which he or she thinks the claims present in view of the state of the art disclosed by the references cited or the objections made. Further, they do not show how the amendments avoid such references or objections.

Instant claims	Adkisson in vew of Asculai, et al.	Nimni, et al. '224 in view of Nimni, et al. '539
21: elastin crosslinked with phenolic tannin	neocartilage matrix of skeletal muscle and other connective tissue fixed with tannic acid.	pericardial tissue crosslinked with natural tannin result in pliability property achieved with the tannin illustrating the presence of elastin within the tissue.
24: collagen crosslinked with glutaraldehyde	neocartilage matrix of skeletal muscle and other connective tissue fixed with glutaraldehyde.	animal tissue selected from tendons, heart valves, pericardium ligaments, skin, blood vessels, fascia, cartilage, and intestine can be crosslinked using standard bifunctional crosslinking reagents, such as natural tannins and gluteraldehyde
48: phenolic tannin bound to crosslinked elastin and aldehyde bound to crosslinked collagen	Adkisson suggest neocartilage comprising type II collagen fixed with tannic acid and Asculai et al. teach the beneficial utility of reinforcing type II collage with elastin protein scaffolds.	It is reasonable to presume that said limitations are encompassed by the invention of Nimni, et al. '224 in view of Nimni, et al. '539because the presumption is supported by the use of similar materials (i.e. animal tissue comprising collagen and elastin) and in the similar production steps (i.e. contacted with glutaraldehyde and natural tannins) to produce the pliable, implantable tissue.

New Grounds of Rejection

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 20, 21, and 48 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Examiner finds no support for any limitation to the inclusion of any residues being bound to the crosslinked elastin or crosslinked collagen.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

7. Claims 20-21, 23-24, 28-29, 48-53 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nimni et al. (US 4,378,224) in view of Nimni et al. (US 5,374,539).

Nimni et al. '224 teach that implant tissues rich in collagen and elastin (see col.4,ln.54-55) selected from the group consisting of tendons, heart valves, pericardium, ligaments, skin, blood vessels, fascia, cartilage and intestine (see col. 2.ln.46-49) are exemplary starting material for prosthetic devices and teach a method that provides for increase stability for allograft or heterograft implantations.

Nimni et al. '224 teach that to improve the longevity of transplanted devices, they propose, a common stabilization technique involving treatment with tanning agents,

such as formaldehyde in the processing of natural tissues. Although heart valves treated with glutaraldehyde can remain functional in situ for many years. However, recent research porcine heart valves indicates that glutaraldehyde preserved implantations can still elicit significant host reactions, including calcification, fibrin deposition and an anaphylactic response. See col.1,ln.15-27.

Nimni et al. '224 do not teach crosslinking with the claimed phenolic tannin and recites tanning agents in general.

Nimni et al. '539 teaches animal tissue selected from tendons, heart valves, pericardium ligaments, skin, blood vessels, fascia, cartilage, and intestine can be crosslinked using standard bifunctional crosslinking reagents, such as natural tannins and gluteraldehyde. See col.5,ln.40-45 and claims 9-11. Nimni et al. '539 provides motivation to one of ordinary skill in the art to crosslink the fibrillar network with tanning reagents to preserve their structure, and decrease the ionic strength thus allowing the molecules to disperse into a suspensions of monomeric or polymeric collagen. It has been noted that such treated tissues become lighter in color and more pliable, an effect that is particularly evident after such matrices are crosslinked with bifunctional reagents such as glutaraldehyde (0.2% solution). See col.4,ln.20-30. This teaching of pliability property achieved with the tannin illustrates the presence of elastin within the tissue and encompasses the material limitation to the claimed implantable fixed tissue exhibiting at least 60% less calcification over being fixed with glutaradehyde.

It would have been obvious to one of ordinary skill in the art, at the time the invention was made, to arrive at an implantable fixed tissue including a residue of

phenolic tannin crosslinking agent because Nimni et al. '224 in combination with Nimni et al. '539 teach pericardial tissue crosslinked with natural tannin to produce a pliable, implantable bioprosthetic. One of ordinary skill in the art would have been motivated to combine the teachings of Nimni et al. '224 with that of Nimni et al. '539 because both references teach the analogous art of stabilizing heart valve implant tissue with tanning agents for improved transplantations.

8. Claims 20-21, 23-24, 28 and 48-52 are rejected under 35 U.S.C. 103(a) as obvious over Adkisson (US 6,645,764) in view of Asculai et al. (US 6,444,222).

Adkisson clearly indicated that the neocartilage composition are useful as implants and as replacement tissue for damaged or defective cartilage. See Abstract, third paragraph, first sentence. Adkisson teach neocartilage matrix of skeletal muscle and other connective tissue is fixed with glutaraldehyde and tannic acid. See col.6,ln.1-10 and col.14,ln.11-12. Adkisson teach that the neocartilage may be mammalian neocartilage, including human and porcine, or avian neocartilage. See col.10,ln.42-50.

Adkisson teaches neocartilage matrix of skeletal muscle and other connective tissue fixed with glutaraldehyde and tannic acid. See col.6,ln.2-3.

In example 4, Adkisson teaches fixing neocartilage with tannic acid and subsequent sterilization following addition of tissue translutaminase. The animals within example 4 showed excellent tolerance of the surgical implants and good adherence of grafts to surrounding tissue. Since, the prior art teaches fixing with tannic acid and surgical implants within the same example, the language of "sterile neocartilage" does not exclude the neocartilage fixed with tannic acid in the same example one paragraph

above. Adkisson teaches that the neocartilage does not require the inclusion of three-dimensional scaffolds, However, such scaffolds can also be used, if desired but either way the cartilage is strong yet malleable. See col.9,ln.50-55.

Adkisson is silent to the claimed fixed tissue comprising crosslinked elastin. Specifically, in table III, Adkisson describes that the neocartilage implants were found to contain type II, type IX and type XI collagen (see col.9,ln.63) but the reference is silent on the neocartilage tissue containing elastin.

Asculai et al. teach collagen type II is reinforced with elastin protein scaffolds in the analogous art of providing mechanical stability that is essential in tissue implantations. See col.3,ln.30-37.

It would have been obvious, to one of ordinary skill in the art, at the time the invention was made, to arrive at the claimed implantable fixed tissue comprising phenolic tannin crosslinked elastin, with a reasonable expectation of success, since the teachings of Adkisson suggest neocartilage comprising type II collagen fixed with tannic acid and Asculai et al. teach the beneficial utility of reinforcing type II collage with elastin protein scaffolds in the analogous art of making an implant.

One of ordinary skill in the art would have been motivated to combine the teachings of Adkisson with that of Asculai et al. since the primary reference suggest the inclusion of protein scaffolds in general and the secondary reference teaches the beneficial utility of elastin protein scaffolds in cartilage comprising type II collagen.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Preeti Kumar whose telephone number is 571-272-1320. The examiner can normally be reached on 9am-5pm M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on 571-272-1119. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Examiner Preeti Kumar
Art Unit 1796

pk

/Vasu Jagannathan/
Supervisory Patent Examiner
Technology Center 1700